

**This Page Is Inserted by IFW Operations
and is not a part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

(19)



Eur päisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

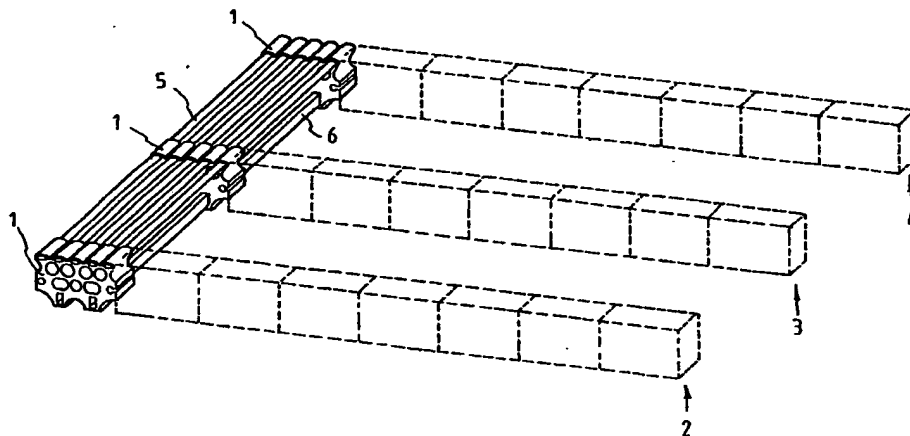
0 444 731 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **91200193.0**(51) Int. Cl.⁵: **A47C 23/06**(22) Date of filing: **01.02.91**(30) Priority: **26.02.90 NL 9000451**(43) Date of publication of application:
04.09.91 Bulletin 91/36(64) Designated Contracting States:
AT BE CH DE DK FR IT LI NL SE(71) Applicant: **van der Ceelen, Petrus Gerardus
Venus 7
NL-5527 CN Hapert(NL)**(72) Inventor: **van der Ceelen, Petrus Gerardus
Venus 7
NL-5527 CN Hapert(NL)**(74) Representative: **Noz, Franciscus Xaverius, Ir.
et al
Algemeen Octrooibureau P.O. Box 645
NL-5600 AP Eindhoven(NL)**(54) **Slatted base.**

(57) A slatted base for seating and reclining furniture, provided with supporting bodies (1) of a resilient material which receive the ends of slats (5) extending parallel to each other, each supporting body (1) having in a lower part two recesses (8) for receiving the ends of connecting means and in an upper portion being provided with means for receiving the ends of said slats (5), whereas the upper part of the two supporting bodies is provided with holes (7) for receiving the ends of upper slats (5), and that the connecting means are formed by additional lower

slats (6) extending between the supporting bodies (1) and being located below the upper slats (5), whilst the central part located intermediate the lower part and the upper part of a supporting body is provided with recesses (9, 10, 11), whose longitudinal axes extend at least substantially parallel to the slats, and the supporting bodies, which are lined up one behind the other when seen in the longitudinal direction of the slatted base, are pivotally coupled together by means of pivot axes extending parallel to the slats.

**Fig 1****EP 0 444 731 A1**

The invention relates to a slatted base for seating and reclining furniture, provided with supporting bodies of a resilient material which receive the ends of slats extending parallel to each other, each supporting body having in a lower part two recesses for receiving the ends of connecting means and in an upper portion being provided with means for receiving the ends of said slats.

Such a slatted base is known from Dutch Patent 185,444.

With this known construction the ends of the slats are accommodated in upper parts of the supporting bodies, which are connected, by means of central ridge parts, to lower parts of the supporting bodies, which are secured to the seating and/or reclining unit by means of pin-shaped connecting means forming part of the frame of the piece of furniture in question, said connecting means being secured in the recesses in question in the lower parts of the supporting bodies. Each supporting body is fixed to the frame of the piece of furniture in question separately, therefore, making the installation or removal of the slatted base, as the case may be, a laborious and time-consuming activity.

The object of the invention is to obtain a slatted board of the above kind, wherein the disadvantages of the known construction can be avoided.

According to the invention this can be achieved in that the upper part of the two supporting bodies is provided with holes for receiving the ends of upper slats, and that the connecting means are formed by additional lower slats extending between the supporting bodies and being located below the upper slats, whilst the central part located intermediate the lower part and the upper part of a supporting body is provided with recesses, whose longitudinal axes extend at least substantially parallel to the slats, and the supporting bodies, which are lined up one behind the other when seen in the longitudinal direction of the slatted base, are pivotally coupled together by means of pivot axes extending parallel to the slats.

In this way a slatted base is obtained which can be provided loose in a frame of a seating or reclining unit or the like, so that the slatted base is easily detachable from the seating or reclining unit, e.g. for cleaning purposes. Because of its construction the slatted base is also collapsible, and thus easily conveyable. This makes it possible inter alia to take along the slatted base in a caravan or the like, in particular so because the slatted base can also be used by simply putting it on the ground.

The invention will be explained in more detail hereafter with reference to a few possible embodiments of the construction according to the invention illustrated in the accompanying Figures.

Figure 1 is a diagrammatic perspective view of

an embodiment of the construction according to the invention.

Figure 2 is a view of a supporting body used with the slatted base according to Figure 1.

Figure 3 is a sectional view of Figure 2, along the line III - III in Figure 2.

Figure 4 is an elevational view of a coupling piece for connecting together supporting bodies disposed side by side.

Figure 5 is a side elevational view of Figure 4.

Figure 6 is a side elevational view of the slatted base illustrated in Figure 1.

Figure 7 is an elevational view of a second embodiment of a supporting body according to the invention.

Figure 8 is a plan view of Figure 7.

Figure 9 is a cross-sectional view of Figure 7, along the line IX - IX in Figure 7.

Figure 10 is a side elevational view of Figure 7.

Figure 11 is a view of a third embodiment of a supporting body according to the invention.

Figure 12 is an elevational view of a fourth embodiment of a supporting body according to the invention.

The slatted base shown in Figure 1 comprises a plurality of supporting bodies 1, which in the illustrated embodiment are arranged to form three rows 2 - 4 of supporting bodies 1, which are lined up one behind the other when seen in the longitudinal direction of the slatted base. As will be apparent from Figure 1, for the sake of simplicity most supporting bodies are only indicated as parallelepipedal blocks.

The supporting bodies 1 serve to support upper slats 5 and are interconnected by means of said upper slats 5 and lower slats 6 having a larger cross-section than said upper slats 5.

The supporting body illustrated in more detail in Figure 2 is made of a resilient elastomer material, e.g. natural rubber. The supporting body is provided with an upper row of openings 7, five in the illustrated embodiment, having an oval section. Said openings 7 are intended to receive the slats 5 having a corresponding section. Near its bottom side the supporting body is provided with two openings 8 having a rectangular section in the illustrated embodiment, which are intended to receive the lower slats 6 having a corresponding section.

It will be apparent that the dimensions of the openings 7 and 8 will be such that the slats 5 and 6 in question are accommodated in said opening with a certain tightness.

Two rows of recesses lie one above the other in the central part of the supporting body, intermediate the upper row of holes or recesses 7 and the lower row of holes or recesses 8. In the illustrated embodiment the upper row is formed by four

recesses 9 whose section is at least substantially circular, said openings, as will be apparent from Figure 2, being staggered with respect to the upper openings or recesses 7, in such a manner that the vertically extending central axes of the recesses 9 are located centrally between the vertically extending central axes of the recesses 7.

The lower row of recesses of the two rows of recesses provided in the central part of the supporting body consists of two recesses 10 having an elongated section, and a recess 11 having a circular section located therebetween. Said recesses 10 and 11 are thereby located immediately below an upper recess 7 and the two outer recesses 10 are also located immediately above the lower recesses 8.

Two recesses 12 having a substantially circular section are provided near the sides of the supporting body, said recesses being in open communication with the sides of the supporting body via slotted passages 13. As is illustrated in Figure 3 a circular groove 14 is provided near the centre of each opening 12. The openings 12 serve to provide the coupling means 15 illustrated in Figures 4 and 5 therein, said coupling means being intended to interconnect the supporting bodies 1 lined up to form rows 2, 3, and 4 respectively. Each coupling means preferably made of a flexible material, such as rubber, comprises two parts 16 and 17 having a substantially circular section, said parts near their centres being provided with an annular projecting rib 18. The two parts 16 and 17 are connected by a connecting rib 19. In order to interconnect two supporting bodies the parts 16 and 17 may be slid into the openings 12 provided in the facing ends of two adjacently disposed supporting bodies. The connecting part 19 will extend through the openings 13 thereby, whilst the projecting ribs will be snapped into the grooves 14 in order to prevent the coupling means from moving in the longitudinal direction of the parts 16 and 17 with respect to the supporting bodies in question. It will be apparent that thus any required number of supporting bodies can be lined up to form a row 2, 3 or 4, in order to obtain the required length of the slatted base, whereby the lined-up support bodies in question are pivotally coupled by means of the coupling means.

As is furthermore illustrated in Figure 3 the recesses 7 and 8 receiving the slats 5 and 6 are closed at one end by wall parts 20 and 21 respectively, so as to bound the movement of the supporting bodies in question across the slats 5 and 6 in question. Of course the lined-up supporting bodies forming a central row 3 will not be provided with such boundary walls 20 and 21.

The slatted base thus formed is an independent unit, which can be placed on any desired

platform, e.g. in reclining or sitting furniture, but also on the ground or the like of course. The lower slats 6 of the slatted base thereby keep the lower part of the slatted base horizontally oriented, whilst only the upper slats 5 will deflect under the influence of the weight of a person making use of the slatted base. In practice it has appeared that an optimal support of the body can be obtained hereby. It is possible thereby to use the slatted base without an upper mattress of the like. When it is considered desirable to provide an upper mattress on the slatted base, so as to obtain a good insulation or offer even more comfort, a thin flexible and light mattress will suffice, such a mattress thus being easy to exchange, air, keep clean and move.

In an advantageous embodiment the greatest width of the upper slats is ± 20 mm and the greatest thickness ± 10 mm, whilst the centre distance between the slats is ± 40 mm. Due to the illustrated and above-described construction of the supporting bodies the slats will thereby move in an at least substantially vertical direction upon deformation of the supporting body. The sectional dimensions of the lower slats are $\pm 20 \times 30$ mm in the illustrated embodiment. The recesses 9 have a diameter of ± 35 mm, the recess 11 has a diameter of ± 25 mm, which approximately corresponds with the height of the recesses 10, whose length is ± 30 mm when measured in horizontal direction. The thinnest parts of the ribs located between the various openings are ± 6 mm thick.

By varying the length of the slats 5 and 6 the width of the slatted base can be adapted to the desired application, whereby said width B may e.g. range from 700 - 1000 mm.

Of course variations to the above-described embodiment of the slatted base, in particular to the construction of the supporting body, will be conceivable within the spirit and scope of the invention.

Thus Figures 7 - 10 illustrate a second embodiment of a supporting body according to the invention. As will be apparent from said Figures the supporting body made of a resilient material is at least substantially formed of thin, interconnected ± 3 mm thick wall parts surrounding openings or passages. The upper openings 23, intended for receiving the upper slats of the slatted base, are thus bounded by wall parts 24. In the illustrated embodiment the supporting body 22 has six elliptical holes or recesses 23, whose largest horizontal axis is ± 20 mm and whose largest vertical axis is ± 10 mm.

The wall parts 24 bounding the adjacent holes 23 are interconnected by means of wall parts 25, which form the upper boundary of further more or less triangular openings or recesses 26 located below and, when seen in plan view, between the

openings 23. Said openings or recesses 26 are bounded by parts of wall parts 27 located between the recesses 26, which bound holes or openings 28 having a circular section. The openings 28 have a diameter of ± 30 mm, and the centre distance between the openings 23 located immediately thereabove is $\pm 39 - 40$ mm. The wall parts 27 bounding openings 28 lying side by side are interconnected by horizontally extending, rib-shaped wall parts 29 located near the centres of the openings 28.

A further row of holes or recesses 30 - 33 is located below the row of openings or recesses 28, said recesses 30 - 33 being bounded by curved wall parts 34 - 37 which, as will be apparent from Figure 7, form part of circular arcs having a radius of ± 25 mm. The outer openings or recesses 30 and 33 are thereby more or less semi-circular, whilst the inner recesses 31 and 32 have a slightly larger diameter. The wall parts bounding the inner recesses 31 and 32 are interconnected by means of a wall part 38 forming a horizontal rib located near the centres of the wall parts 35 and 36.

The supporting body 22 is provided with two openings or recesses 39 having a circular section, so as to receive the lower slats of the slatted base, said openings or recesses 39 being bounded by wall parts 40. The diameter of the openings 39 is ± 25 mm.

The two wall parts 40 bounding the openings 39 are interconnected by two wall parts 41 and 42 extending horizontally above each other, said wall parts forming ribs and possibly being connected by means of a vertical rib 43 extending between said wall parts 41 and 42.

The wall parts 39 and 40, with the wall parts 35 and 36 bounding the openings 31 and 32 located thereabove, are connected, in the manner illustrated in Figure 7, to wall parts or ribs 44 and 45 extending perpendicularly to the plane of the drawing, said wall parts or ribs 44 and 45 extending radially with respect to the centres of the wall parts 35 and 36 in question, and including an angle of $\pm 18^\circ$ with the vertical through the centre in question thereby.

A wall part 46 forming a vertically extending rib is furthermore provided on top of the wall part 41, said wall part 46 near its end joining the ribs 44 and 45 and the lower parts of the wall parts 35 and 36 that join said ribs. A wall part 47 forming a strengthening rib is furthermore provided between the wall parts 34 and 40, said wall part 47 also joining the wall part 35 and the rib 44 in the manner illustrated in Figure 7. A similar wall part 48 is provided between the right-hand wall part 40, when seen in Figure 7, and the wall part 37.

Upper slats of the slatted base may be provided, in a similar manner as described with refer-

ence to Figures 1 - 6, in the holes 23, whilst lower slats having a larger diameter may be provided in the holes 39, so as to form a slatted base as described above.

As appears in particular from Figure 8, the construction of the wall parts 24 bounding the two outer openings 23 of the supporting body is such that they only extend over half the width of the supporting body, so as to interconnect supporting bodies lined up one behind the other. At the one side of the longitudinal centre plane of the supporting body the wall part 24 in question is thereby located near the one end of the supporting body, and at the other side of said longitudinal centre plane said wall part is located near the other end of the supporting body. The wall parts 24 of two supporting bodies lined up one behind the other can thus be arranged side by side so as to receive one and the same upper slat. Thus the lined-up supporting bodies are automatically pivotally coupled together by means of the outer slats supported by the supporting bodies in question.

Also with this construction of the supporting bodies a good springing action of the upper slats supporting the body of a user or the like will be possible, whilst the lower slats accommodated in the holes or recesses 39 will practically not be deformed under said load, and keep the lower parts of the supporting bodies in a horizontal plane.

The embodiments of the supporting bodies illustrated in Figures 11 and 12 at least substantially correspond with the embodiment of the supporting body illustrated in Figure 7 - 10, and those parts in Figure 11 and 12 that correspond with corresponding parts in the embodiment according to Figures 7 - 10 have been given the same numerals as those used in connection with Figures 7 - 10, therefore.

In the embodiment according to Figure 11 ribs or wall parts 49 - 52 being in line with the wall part forming a rib 38 and being integral with the other parts of the supporting body are provided in the recesses or openings 30 - 33. It will be apparent that by providing said horizontally extending ribs or wall parts 49 - 52 the wall parts 34 - 37 bounding the recesses 30 - 33 will less readily move in a direction away from each other near the ribs 49 - 52, so that when using the embodiment according to Figure 11 a supporting element has been obtained which offers greater resistance to a downward movement of the upper slats accommodated in the openings or holes 23.

With the embodiment according to Figure 12 a further reinforcement has been obtained by providing wall parts 53 forming further ribs in the openings or recesses 28, in line with the wall parts 29 forming ribs, said wall parts 53 being integral with the wall parts 27 bounding the openings or recesses and extending diametrically opposite confront-

ing points of said wall parts 27.

In the above description the terms horizontal and vertical have been used in conjunction with the assumption that the position of the slatted base is level and horizontal. It will be obvious, however, that the slatted base may also be used in other positions, wherein parts of the slatted base may include an angle with each other.

Claims

1. A slatted base for seating and reclining furniture, provided with supporting bodies of a resilient material which receive the ends of slats extending parallel to each other, each supporting body having in a lower part two recesses for receiving the ends of connecting means and in an upper portion being provided with means for receiving the ends of said slats, characterized in that the upper part of the two supporting bodies is provided with holes for receiving the ends of upper slats, and that the connecting means are formed by additional lower slats extending between the supporting bodies and being located below the upper slats, whilst the central part located intermediate the lower part and the upper part of a supporting body is provided with recesses, whose longitudinal axes extend at least substantially parallel to the slats, and the supporting bodies, which are lined up one behind the other when seen in the longitudinal direction of the slatted base, are pivotally coupled together by means of pivot axes extending parallel to the slats.
2. A slatted base according to claim 1, characterized in that rows of recesses, located at different heights, are provided in the central part of the supporting body.
3. A slatted base according to claim 1 or 2, characterized in that the recesses in the one row are disposed staggered in a direction perpendicular to the longitudinal direction of the slats with respect to the recesses in a row located therebelow.
4. A slatted base according to any one of the preceding claims, characterized in that an at least substantially horizontally extending reinforcing rib is provided in a recess located in the central part of the supporting body, said reinforcing rib extending between two points located at least substantially farthest away from each other of the inner boundary wall of the recess in question.
5. A slatted base according to any one of the preceding claims, characterized in that the lower slats have a larger section than the upper slats.
6. A slatted base according to any one of the preceding claims, characterized in that the section of the upper slats is at least substantially elliptical and that said upper slats are disposed in such a manner that in unloaded condition the longitudinal axes of the slats extend at least substantially horizontally.
7. A slatted base according to any one of the preceding claims, characterized in that the supporting body is formed by interconnected wall parts bounding recesses or holes, said wall parts having a thickness of 4 - 8 mm.
8. A slatted base according to any one of the preceding claims, characterized in that the wall parts bounding the holes for the upper slats are interconnected by horizontally extending connecting ribs.
9. A slatted base according to any one of the preceding claims, characterized in that near their bottom sides the wall parts defining the recesses for the upper slats are connected by wall parts forming the upper boundaries of recesses located therebelow.
10. A slatted base according to any one of the claims 2 - 9, characterized in that recesses, which are provided in the central part of the supporting body, are mainly bounded by wall parts in the shape of a circular arc.
11. A slatted base according to any one of the preceding claims, characterized in that two adjacent lined-up supporting bodies are interconnected by a coupling means formed of two bar-shaped parts having a round section connected by a connecting rib, said bar-shaped parts being accommodated in correspondingly shaped holes in the facing sides of the supporting bodies in question.
12. A slatted base according to any one of the preceding claims 1 - 10, characterized in that the width of the wall parts bounding the holes for the outer, upper slats to be connected to a supporting body is about half the width of the supporting body and that said wall parts are located on different sides of a longitudinal central plane of the supporting body, in such a manner that said wall parts of two adjacent supporting bodies can be placed side by side.

so as to receive the end of an upper slat.

13. A slatted base according to any one of the preceding claims, characterized in that both
near their ends and near their centres the slats 5
are supported by a supporting body.
14. A supporting body obviously intended for a
slatted base according to the preceding
claims. 10

15

20

25

30

35

40

45

50

55

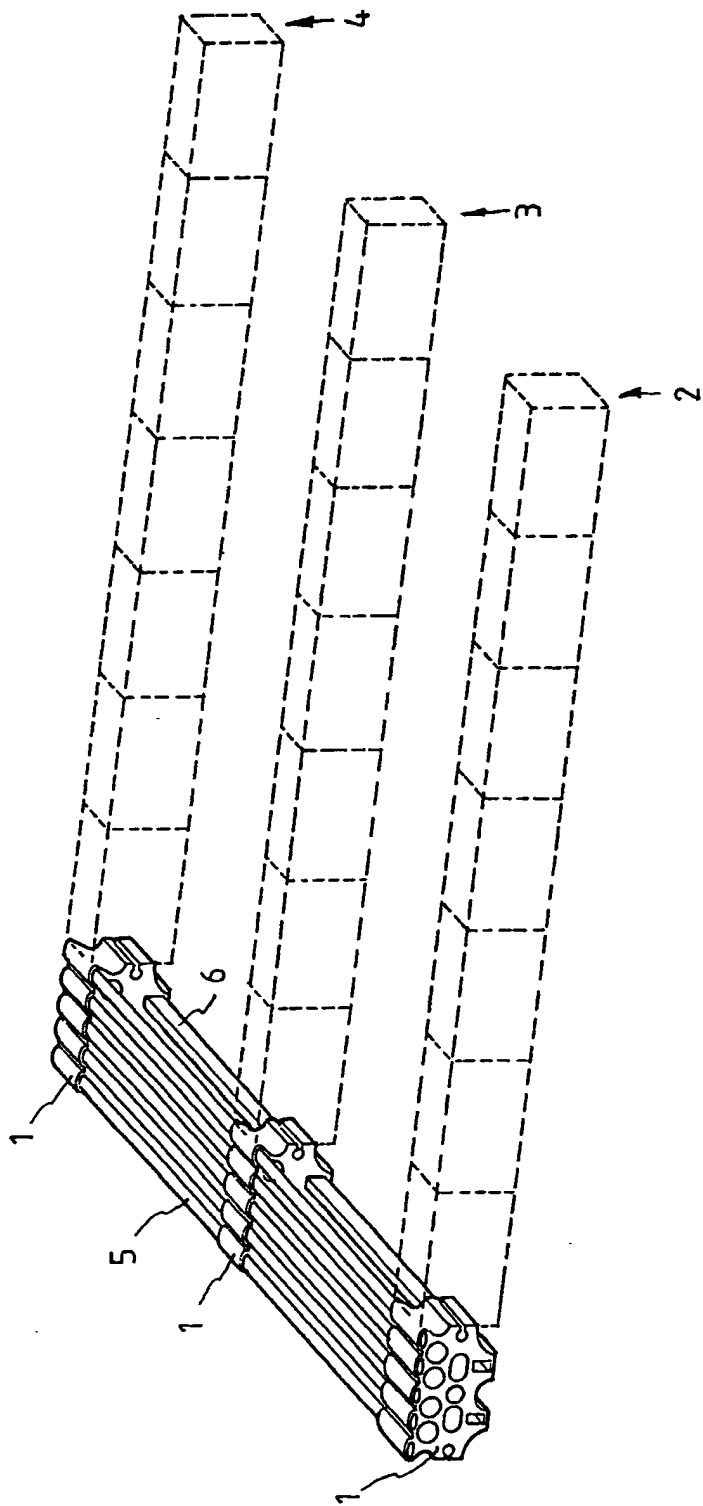


Fig 1

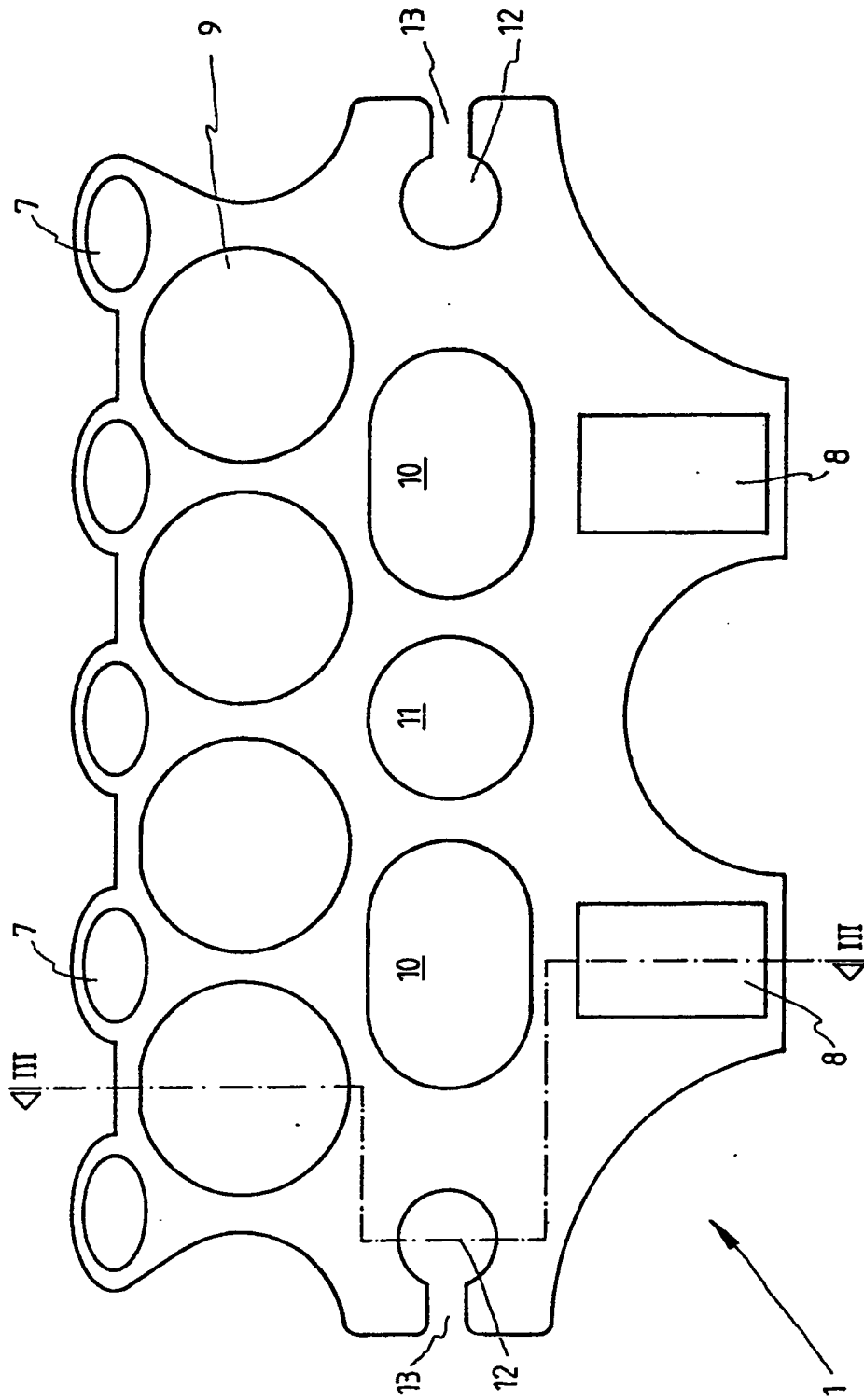


Fig 2

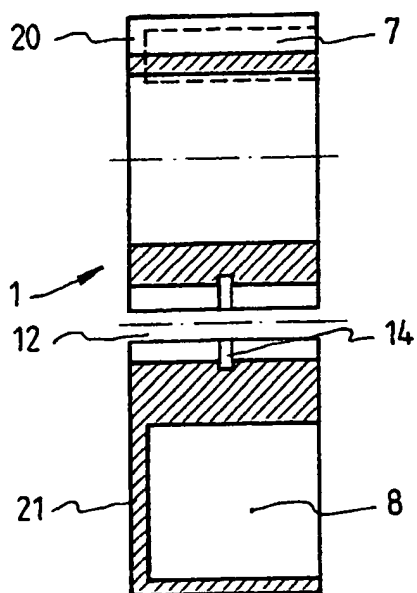


Fig 3

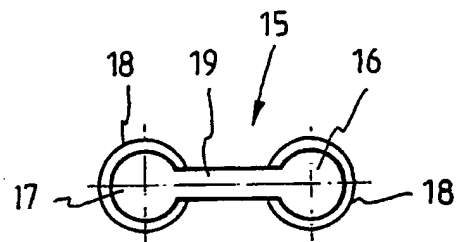


Fig 4

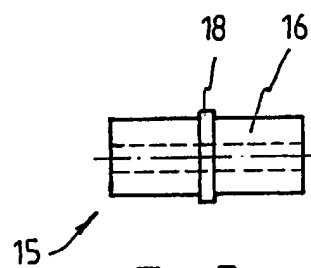


Fig 5

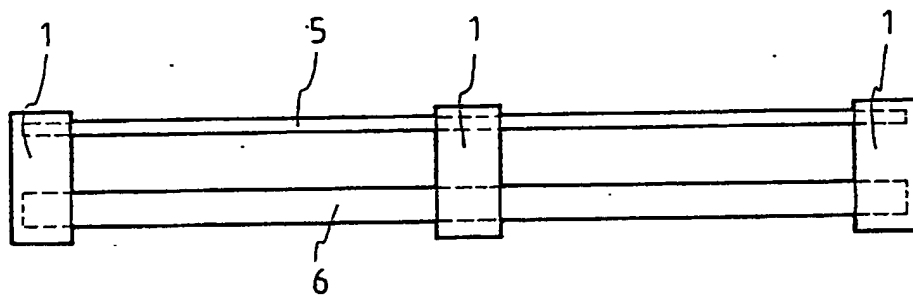


Fig 6

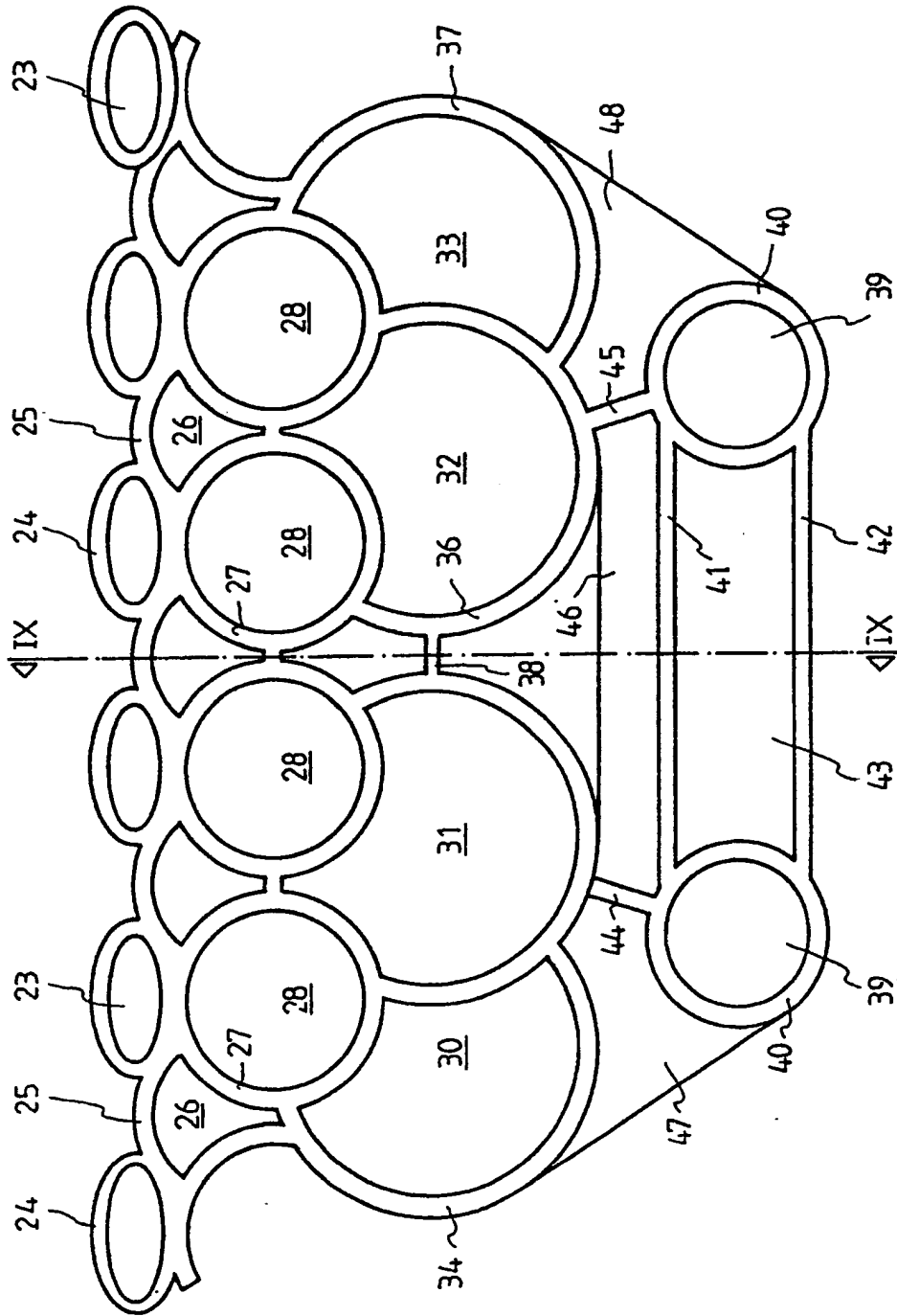


Fig 7

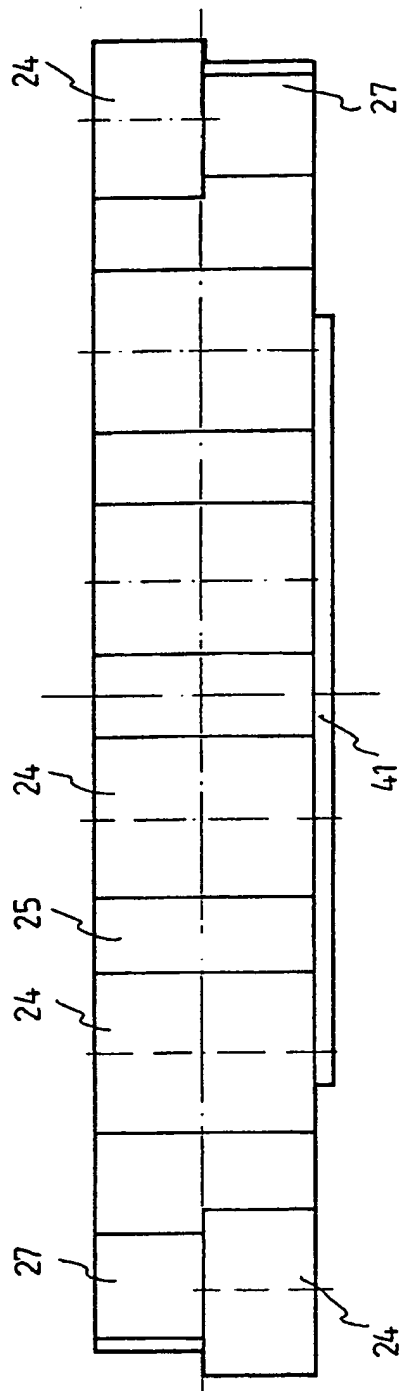


Fig 8

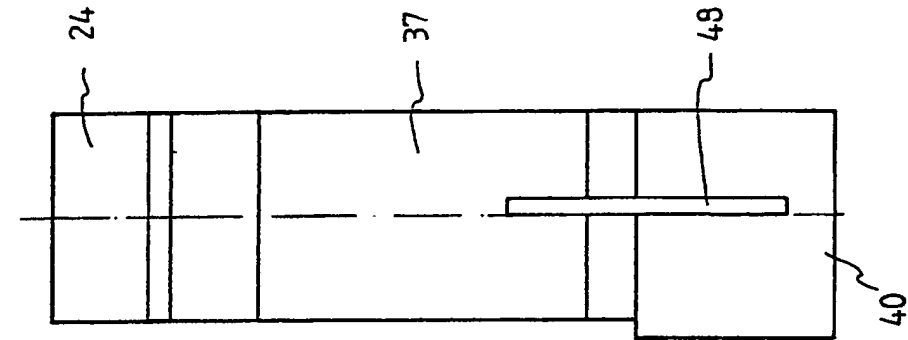


Fig 10

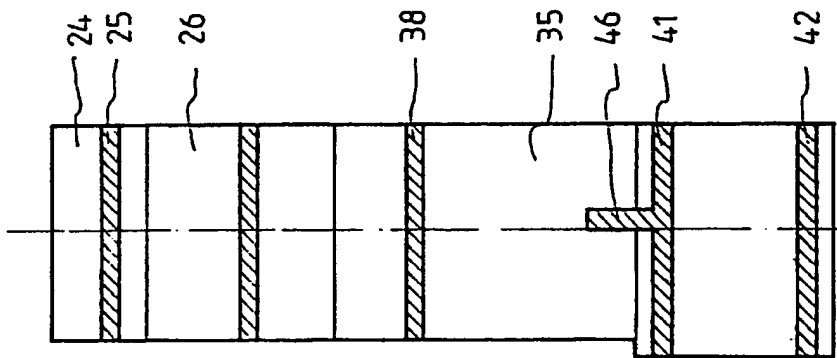


Fig 9

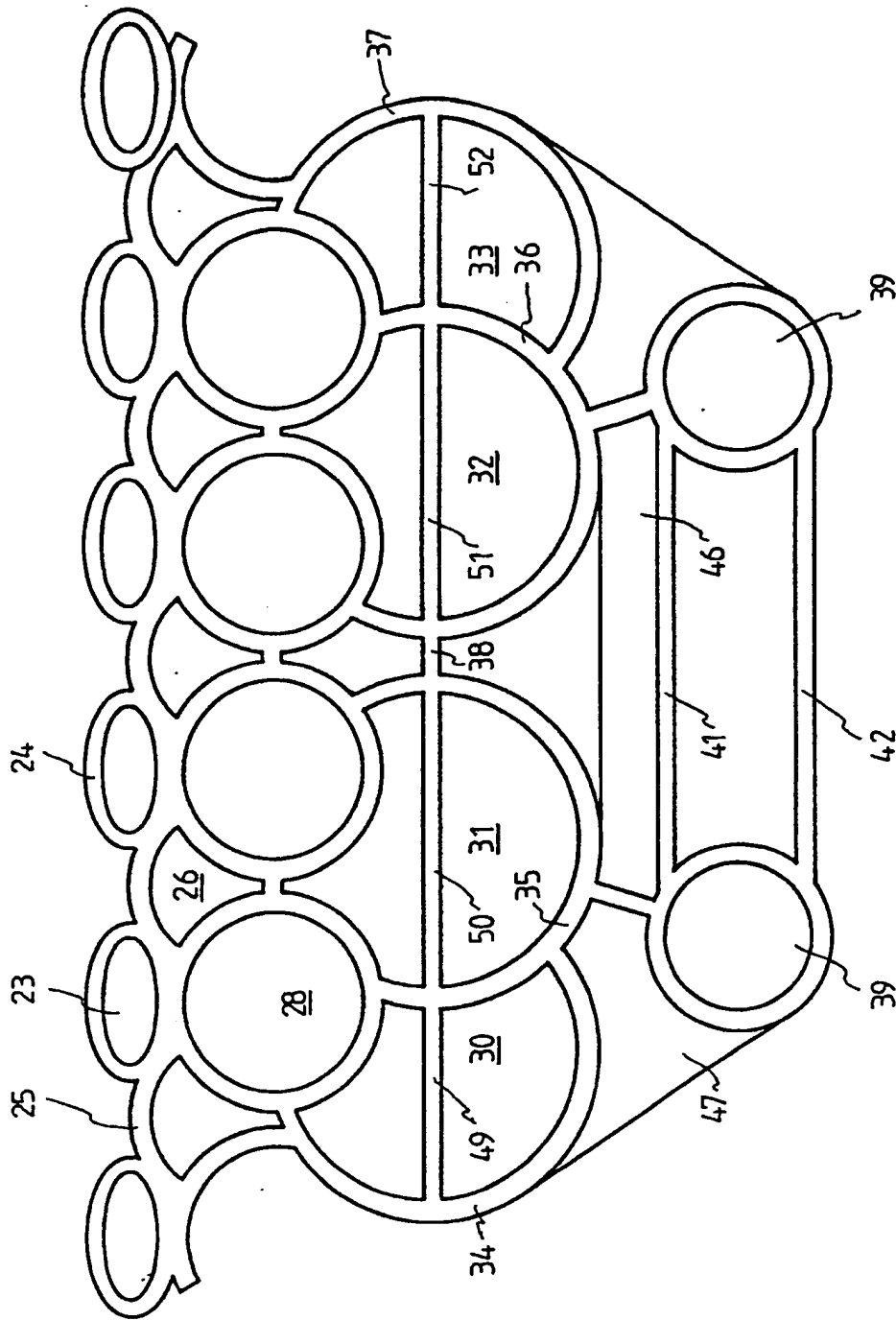


Fig 11

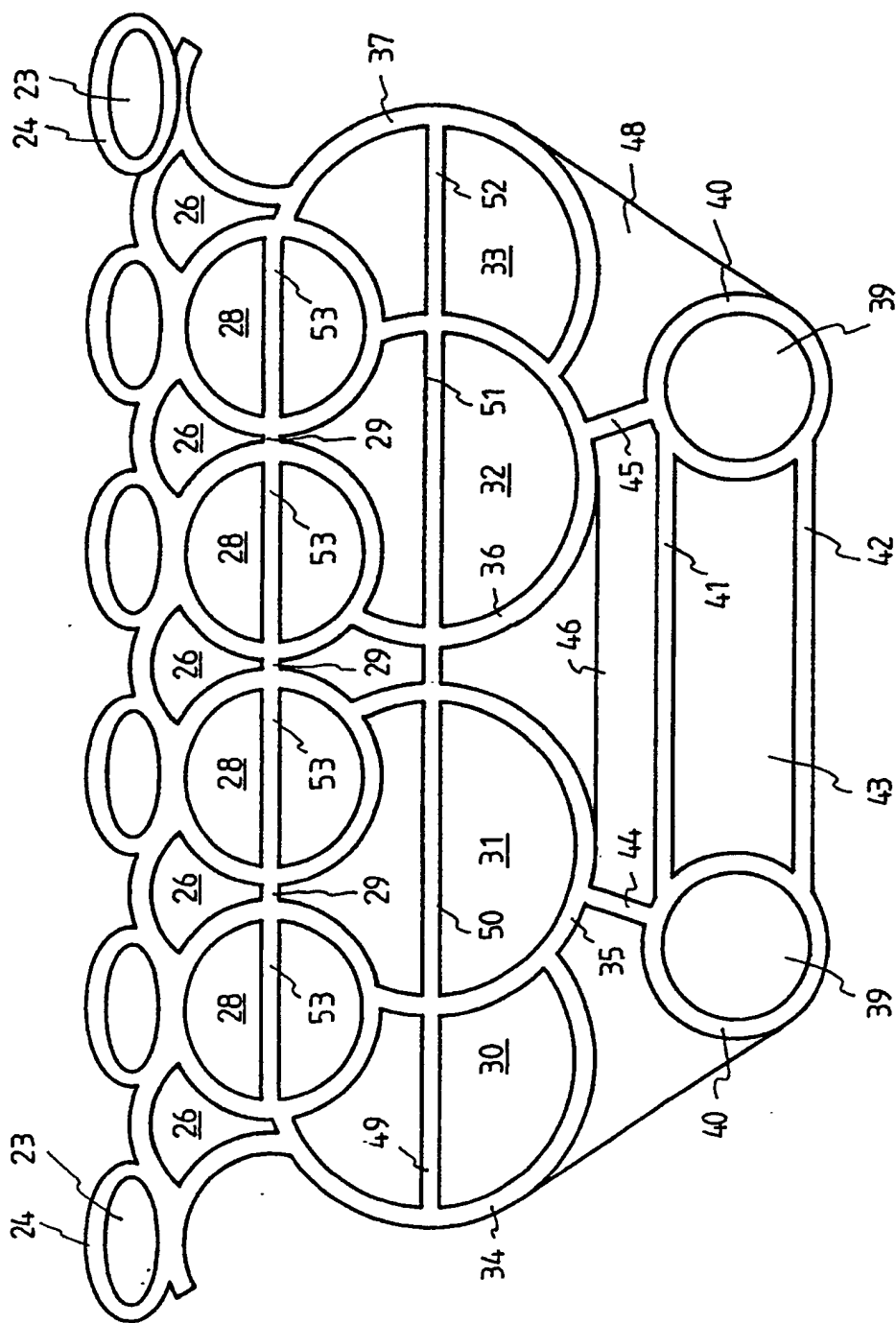


Fig. 12



European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 20 0193

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	DE-U-8 809 806 (PLANETA) * page 7, last paragraph - page 11, paragraph 4; figures * - - - -	1,5,8,13	A 47 C 23/06
A	FR-A-2 490 473 (MARTINEZ) * page 2, line 37 - page 4, line 19; figures * - - - -	1	
A	DE-U-8 910 759 (BIO-RONDON) * page 11 - page 14; figures * - - - -	1,13	
A	WO-A-8 501 425 (LIFORM) * page 4, last paragraph - page 6, paragraph 2; figures * - - - -	1,13	
A	DE-U-8 806 330 (HÜLSTA-WERKE) * claim 1; figures * - - - -	1,2,3	
A	CH-A-6 087 08 (HUBER & SUHNER) * page 2, line 27 - line 34; figure 1 * - - - -	1,2	
A	EP-A-0 274 371 (WATTEAU) - - - - -		
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		29 May 91	VANDEVONDELE J.P.H.
<div><div>CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention</div><div>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document</div></div>			